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10/089,108	03/26/2002	Shunichi Igarashi	216419US3PCT	5527

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER

MCDERMOTT, KEVIN

ART UNIT	PAPER NUMBER
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3635

DATE MAILED: 05/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/089,108

**Applicant(s)**

IGARASHI, SHUNICHI

**Examiner**

Kevin McDermott

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4,16,27,29,31,33,36,37 and 40 is/are allowed.
- 6) ☒ Claim(s) 1-3,5-15,17-26,28,30,32,34,35,38 and 39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>March 5, 2004</u> .   | 6) <input type="checkbox"/> Other: ____.                                    |

## DETAILED ACTION

### *Claim Objections*

Claims 24 and 37 are objected to because of the following informalities:

Regarding claim 24, line 3, it appears that --and-- should be inserted between "length" and "an".

Regarding claim 37, Examiner does not know what "thereamong" means. Examiner interpreted it as meaning "therebetween".

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 6, 11, 12, 17, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Fyfe.

Fyfe discloses in figures 1-4 and in column 4, lines 53-65, and in column 7, line 68 to column 8, line 7, a column 1 having an elongated central portion 9 rising above base 3, terminating at an upper support end 11 usually in the form of a flat surface that is connected or otherwise attached to an overhead structure 13 to provide support thereto. A membrane 27 is disposed on the column 1 and at least one layer 41 of high-strength, stretchable fiber or fibers is disposed thereon. Membrane 27 is a weak layer disposed between the column 1 and the fiber layer 41. The stretchable fibers usable in

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layer 41 may be selected from a wide range of high-strength material, such as carbon fibers, graphite fibers, polyester fibers, glass fibers, polyaramid fibers and combinations thereof. Fibers 41 may be formed into a tape having a width variable between 2 to 48 inches. The tape may be applied with or without adhesive. It is preferably pulled tightly while being applied.

Fibers 41 may be made in a roll of narrow tape 42. When using narrow fiber tape 42, it is preferred to wrap it around the column surface at an angle "b" as shown in figure 3 and overlap a portion of the previous wrap. It is preferred that the angle be held constant throughout the entire wrapping, except to be reversed during any subsequent layer applied thereover.

Regarding claims 1 and 39, the narrow tape 42 is the claimed high-ductility material wrapped around the circumference of a structure. Because the fiber tape 42 comprises a fibrous origin, its initial elastic modulus is inherently lower than the elastic modulus of concrete.

Regarding claim 2, the narrow tape 42 is made from fibrous materials as explained above.

Regarding claim 3, the narrow tape 42 is a fibrous tape-like material and wound spirally on the column 1 while overlapping at overlap portions.

Regarding claim 5, as explained above, the tape 42 may be applied using an adhesive.

Regarding claim 6, using adhesive to apply the tape 42 to the column 1 would bond the overlap portions together. Examiner has interpreted "and/or" as "or".

Regarding claim 11, Column 8, lines 57-65 disclose a hardenable, low or non-shrinkable liquid material 75 being pumped through injection means 33, to fill the area between the column surface and the membrane 27. Column 9, lines 34-52 disclose the material 75 being hardenable polyester resins, hardenable epoxy resins, and mixtures of these two materials.

Regarding claim 12, the membrane 27 is a weak layer and is disposed between the column and the tape 42.

Regarding claim 17, as explained above, the tape 42 may be applied using an adhesive.

Claims 13-15, 22, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Salek-Nejad.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Salek-Nejad discloses in figures 13-16 and in column 8, line 59 – column 9, line 67, a flexible strap of reinforcing material 24 for wrapping around a concrete column to repair and strengthen the column.

Regarding claim 13, the preferred components for the flexible strap/belt 24 are a plurality of strands. Nonmetallic materials are preferred for the construction of the strands, although metallic materials and combinations of nonmetallic and metallic materials can be used as well. Each strand is composed of fibers selected from a group consisting of carbon fibers, graphite fibers, glass fibers, organic fibers, synthetic fibers,

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and metal fibers, or composite fibers made up of combinations of such fibers. Because the belt 24 is comprised of a fiber origin, its initial elastic modulus is lower than the elastic modulus of concrete.

The flexible belts 24 of reinforcing material are preferably wrapped while applying a tension force to them. The magnitude of this tensile force can vary from close to zero to close to the tensile strength of the belt.

A preferred method of strengthening the column comprises wrapping a flexible strap of reinforcing material in the form of a single belt 24 around the column in a spiraling fashion. The single belt 24 of reinforcing material is wrapped circumferentially about the exterior of the concrete column and longitudinally along the height of the concrete column in either one of two continuous spiraling relationships. As shown in figures 13 and 14, the successive turns of the belt 24 are placed from one another at selected spacing 36. As shown in figure 15, the turns of the single belt 24 are placed in overlapping edge-to-edge contacting relation 38.

Regarding claim 14, as explained above the belt 24 is made from fibers.

Regarding claim 15, the belt 24 is made from fibers, is wound spirally on the outer surface of a column in a fixed and overlapping condition.

Regarding claims 22 and 23, column 10, lines 23-39 disclose wrapping the belt 24 around the concrete column, in an outwardly spaced relationship therefrom. The outwardly spaced relationship of the single flexible belt creates a gap 42 around the exterior or outer surface 44 of the concrete column and takes on the form of an outer shell 46 about the concrete column. A plurality of spacers 47 are placed in spaced

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relation to one another about the concrete column to assist in forming the single belt into the shell 46. The outer shell 46 defined by the single flexible belt has a length substantially equal to the desired height of the concrete column to be strengthened.

The gap 42 between the concrete column and the outer shell 46 can be filled with a variety of materials including, but not limited to, ordinary resin, ordinary grout, expansive resin, or expansive grout.

The gap 42 is the claimed cavity. Additionally, in order for the ordinary resin to fill the space between the outer shell 46 and the column it must be viscous.

Claims 26, 30, 32, 34, and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Fawley.

Fawley discloses in figure 2 and in column 5, line 42 to column 6, line 31, reinforcing a concrete column 45 with fabric made from fibers 38, 40 and resin 41. The fibers are made from material including a large plurality of bi-directional, lightweight, high tensile strength, electrically nonconductive, nonmetallic, high elongation filaments. The reinforcement material, in the form of sleeves or jackets, are placed around a primary load bearing member, such as concrete column 45 (fig. 7) and fixed in place by an adhesive. The fabric is a high ductility material. Because the fabric is comprised of a fibrous material, its initial modulus of elasticity is inherently lower than the elastic modulus of concrete.

Specifically, regarding claim 32, Examiner considered the language following "configured to be", recited in line 4, as functional.

Specifically, regarding claim 35, lines 4 and 7 recite "configured to be". Examiner considered the language following these phrases to be functional.

Because Fawley discloses the claimed structural limitations, it is inherently capable of performing the same functions or of being used in the same fashion.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 28 is rejected under 35 U.S.C. 102(b) as being anticipated by Norwood.

Norwood discloses in figures 1-4, and in column 6, lines 2-15, a rubber strip 2 wrapped helically around a pole and a glass reinforced polyester two-piece sleeving system<sup>3</sup> placed symmetrically around the pole.

The rubber strip 2 is the claimed high ductility material and the sleeving system 3 is the claimed facing surrounding wall material. The initial modulus of elasticity of the rubber strip 2 is inherently lower than the modulus of elasticity of concrete. The rubber strip 2 is disposed inside the sleeving system 3 and a cavity is interposed between the column and the sleeving system 3.

Because Norwood discloses the claimed structural limitations, it is inherently capable of performing the same functions.

Claim 38 is rejected under 35 U.S.C. 102(b) as being anticipated by Norwood.



Norwood discloses in figures 1-4, and in column 6, lines 2-15, a rubber strip 2 wrapped helically around a pole and a glass reinforced polyester two-piece sleeving system 3 placed symmetrically around the pole.

The sleeving system 3 is the claimed facing surrounding wall material. The initial modulus of elasticity of the sleeving system 3 is inherently lower than the modulus of elasticity of concrete. A cavity is interposed between the column and the sleeving system 3.

Because Norwood discloses the claimed structural limitations, it is inherently capable of performing the same functions.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salek-Nejad in view of Fyfe.

Salek-Nejad's disclosure is discussed above. However, Salek-Nejad does not disclose using an adhesive to attach the belt 24 to the column.

Fyfe discloses using an adhesive to apply a tape 42 to a column for structural reinforcement.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adhesively attach the belt 24 of Salek-Nejad to the column.

One of ordinary skill would be motivated to make such a modification to provide a strong and stable bond between the belt 24 and column, to ultimately prevent failure of the column.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isley, Jr. (U.S. Patent No. 5,607,527) in view of Probst and further in view of Ingalls and Neuner (U.S. Patent No. 5,925,579).

Isley discloses in figure 2 and in column 4, lines 4-47, a concrete column 10 reinforced with a composite layer 22. The layer 22 is made from 4 fabric layers 24, 26, 28, 30 and 32. Figure 2 shows a fabric 54 being unwound from roll 56 and dipped in resin 58. The material 54 constituting the layer 22 is the claimed high ductility material that is provided in roll form. Because material 54 is comprised of fabric, it's initial elastic modulus is inherently lower than the elastic modulus of concrete. However, Isley does not disclose the roll including a core, a plurality of parting lines drawn on one side of the material in the longitudinal direction, or applying the material to a structural member at any one of two or more pitches.

Ingalls discloses in figures 1-4 and in column 2, lines 35-40, wrapping a material about a core 2 for shipment. The core 2 may be made of any material so long as it is strong and stiff enough to support the weight of the wrappings.

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Probst discloses in figure 2, providing roofing paper, in roll form, having two sets of longitudinal guide lines.

Neuner discloses in figure 1 applying reinforcing material to a structural member/column at a pitch.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the material of Isley to be wrapped around a core in roll form, to include a plurality of longitudinal parting lines, and to apply it to a structural member at any one of two or more pitches.

One of ordinary skill would be motivated to provide the material wrapped around a core so that it is easier to transport to a jobsite. One of ordinary skill would be motivated to provide the material with guide lines to properly align the material when wrapping it around a structural member. One of ordinary skill would be motivated to wrap the material at any one of two or more different pitches (matching the number of sets of guidelines) to provide safe reinforcement in an underwater environment.

Regarding claim 25, the guidelines of Probst are visually distinguishable from each other.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fyfe.

Fyfe's disclosure is discussed above. However, Fyfe does not specifically disclose applying the tape 42 such that at least a rolling start end portion is bonded to the structural member while a rolling termination end portion is bonded to a portion of an underlying layer of the tape 42.

It would have been an obvious design choice to apply the tape 42 such that at least a rolling start end portion is bonded to the structural member while a rolling termination end portion is bonded to a portion of an underlying layer of the tape 42, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

One of ordinary skill would have been motivated to make such a modification to safely reinforce a structural member.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fyfe.

Fyfe's disclosure is discussed above. However, Fyfe does not specifically disclose applying the tape 42 such that intermediate layers of the tape 42 are bonded together at least a single zonal region extending along a length direction of the member.

It would have been an obvious design choice to apply the tape 42 such that intermediate layers of the tape 42 are bonded together at least a single zonal region extending along a length direction of the member, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

One of ordinary skill would have been motivated to make such a modification to safely reinforce a structural member.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fyfe.

Fyfe's disclosure is discussed above. However, Fyfe does not specifically disclose applying the tape 42 such that at least a rolling start end portion of the high ductility material is bonded to a corresponding portion of an outer surface of the

member while a rolling termination end portion of the tape 42 is bonded to a corresponding portion of an underlying layer of the tape 42.

It would have been an obvious design choice to apply the tape 42 such that at least a rolling start end portion of the high ductility material is bonded to a corresponding portion of an outer surface of the member while a rolling termination end portion of the tape 42 is bonded to a corresponding portion of an underlying layer of the tape 42, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

One of ordinary skill would have been motivated to make such a modification to safely reinforce a structural member.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fyfe.

Fyfe's disclosure is discussed above. However, Fyfe does not specifically disclose overlapping at overlap portions before or after the tape 42 is rolled on the member at upper and lower portions of the member by being rolled tightly on the member by a plurality of turns to thereby be rolled in layers such that at least a rolling start end portion of the tape 42 is bonded to a corresponding portion of an outer surface of the member while a rolling termination end portion of the tape 42 is bonded to a corresponding portion of an underlying layer of the tape 42.

It would have been an obvious design choice to overlap at overlap portions before or after the tape 42 is rolled on the member at upper and lower portions of the member by being rolled tightly on the member by a plurality of turns to thereby be rolled in layers such that at least a rolling start end portion of the tape 42 is bonded to a

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corresponding portion of an outer surface of the member while a rolling termination end portion of the tape 42 is bonded to a corresponding portion of an underlying layer of the tape 42, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

One of ordinary skill would have been motivated to make such a modification to safely reinforce a structural member.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salek-Nejad.

Salek-Nejad's disclosure is discussed above. However, Salek-Nejad does not specifically disclose the belts 24 rolled tightly on the structural member in a plurality of layers such that at least a rolling start end portion of the belt 24 is bonded to a corresponding portion of an outer surface of the member are bonded together and/or such that the belt 24 is bonded to a surface of the member at at least a single zonal region extending along a length direction of the member.

It would have been an obvious design choice to roll the belt 24 tightly on the structural member in a plurality of layers such that at least a rolling start end portion of the belt 24 is bonded to a corresponding portion of an outer surface of the member are bonded together and/or such that the belt 24 is bonded to a surface of the member at at least a single zonal region extending along a length direction of the member, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

One of ordinary skill would have been motivated to make such a modification to safely reinforce a structural member.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salek-Nejad.

Salek-Nejad's disclosure is discussed above. However, Salek-Nejad does not specifically disclose spirally winding the belts 24 about the structural member in a fixed and overlapping condition combined with being rolled tightly on the member in a plurality of layers such that at least a rolling start end portion of the belt 24 is bonded to a corresponding portion of an outer surface of the member while a rolling termination end portion of the belt 24 is bonded to a corresponding portion of an underlying layer of the belt 24.

It would have been an obvious design choice to spirally wind the belt 24 about the structural member in a fixed and overlapping condition combined with being rolled tightly on the member in a plurality of layers such that at least a rolling start end portion of the belt 24 is bonded to a corresponding portion of an outer surface of the member while a rolling termination end portion of the belt 24 is bonded to a corresponding portion of an underlying layer of the belt 24, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

One of ordinary skill would have been motivated to make such a modification to safely reinforce a structural member.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Salek-Nejad.

Salek-Nejad's disclosure is discussed above. However, Salek-Nejad does not specifically disclose spirally winding the belts 24 about the structural member in a fixed and overlapping condition before or after the belt 24 is rolled on the structural member at upper and lower end portions of the structural member by being rolled tightly on the member in a plurality of layers such that at least a rolling start end portion of the belt 24 is bonded to a corresponding portion of an outer surface of the member while a rolling termination end portion of the belt 24 is bonded to a corresponding portion of an underlying layer of the belt 24, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

It would have been an obvious design choice to spirally wind the belt 24 about the structural member in a fixed and overlapping condition before or after being rolled tightly on the member in a plurality of layers such that at least a rolling start end portion of the belt 24 is bonded to a corresponding portion of an outer surface of the member while a rolling termination end portion of the belt 24 is bonded to a corresponding portion of an underlying layer of the belt 24, since applicant has not disclosed that doing so solves any stated problem or is for any particular purpose.

One of ordinary skill would have been motivated to make such a modification to safely reinforce a structural member.

### ***Response to Arguments***

Applicant's arguments filed 2/9/04 have been fully considered but they are not persuasive.



Regarding claim 1 and all claims depending therefrom, Applicant argues that Fyfe does not state that the liquid material 75 with the membrane 27 is a high ductility material or that this combination has an elastic modulus lower than the elastic modulus of concrete. Examiner disagrees.

The rejection of claim 1 asserts that the narrow tape 42 is the high ductility material, not the combination of the liquid material 75 with the membrane 27, so it appears that applicant's argument is misplaced. Additionally, the rejection of claim 1 above explains that the elastic modulus of the tape 42 is inherently less than the elastic modulus of concrete.

Regarding claim 13 and all claims depending therefrom, Applicant argues that Salek-Hejad does not state that the strap impregnated with resin is a high ductility material or that its initial elastic modulus is lower than that of concrete. Examiner disagrees.

The strap impregnated with resin is inherently a high ductility material and inherently has an initial modulus of elasticity less than that of concrete.

Regarding claim 34, Applicant argues that Fawley does not state that the sleeve or jacket is a high-ductility material or that it has an initial elastic modulus less than that of concrete. Examiner disagrees.

The sleeve or jacket is inherently a high ductility material and inherently has a lower modulus of elasticity than concrete.

Regarding claim 35, Applicant argues that neither Salek-Nejad nor Fyfe teaches or suggests the claimed features of a high ductility material having an initial elastic modulus lower than that of concrete.

Claim 35 is rejected under Fawley as detailed above.

Regarding claim 24 and all claims depending therefrom, Applicant argues that Isley does not state that the fabric 54 with the resin 58 is a high ductility material, and further that the fabric has an initial elastic modulus lower than an elastic modulus of concrete. Examiner disagrees.

The fabric is inherently a highly ductile material and inherently has an initial elastic modulus less than that of concrete.

Regarding claims 26 and 30, Applicant argues that Fawley does not state that the sleeve or jacket is a high ductility material having an initial elastic modulus lower than that of concrete. Examiner disagrees.

The fabric is inherently a high ductility material. Because the fabric is comprised of a fibrous material, its initial modulus of elasticity is inherently lower than the elastic modulus of concrete.

Regarding claims 28 and 32, Applicant argues that Norwood does not state that the two-piece sleeve system 3 with the inert hardenable core material 4 is a high ductility material, and further does not show that the two piece sleeve system 3 with the inert hardenable core material 4 has an initial elastic modulus lower than that of concrete. Examiner disagrees.

Claim 32 is now rejected by Fawley. Regarding claim 28, the rejection is not based on the two-piece sleeve system 3 with the inert hardenable material 4, but on the system 3. Additionally, the rubber strip 28 is inherently a highly ductile material and inherently has a lower modulus of elasticity than concrete.

***Allowable Subject Matter***

Claims 4, 16, 27, 29, 31, 33, 36, 37, and 40 are allowed.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Kevin McDermott, whose telephone number is 703-308-8266.

KM 5/6/04

KM



Carl D. Friedman  
Supervisory Patent Examiner  
Group 3600